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Oil and Gas Conservation Commission OF THE STATE OF MONTANA

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ANNUAL REVIEW FOR THE YEAR 1966

Relating to

OIL AND GAS

Volume 10

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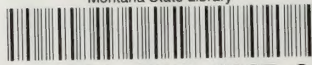
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Annual Review for the Year 1966 Volume 10

INTRODUCTION

This is the tenth Annual Review of drilling and producing operations in Montana.

Production during 1966 reached an all time high of 35,380,000 barrels as compared to the previous high of 32,778,000 barrels in 1965. Total remaining oil reserves at the end of 1966 are estimated to be 393,000,000 barrels as compared to 408,000,000 barrels a year ago.


The record production rate during 1966 was due mainly to development of large reservoirs found during the past three years. Several significant discoveries but no major discoveries were made during 1966.

During 1966 a total of 482 wells were drilled in Montana. These included 198 wildcats and 284 development wells. Of the wildcats there were 10 oil discoveries, 3 gas discoveries and 185 dry holes. The wildcat dry hole ratio was 15.2 to 1. The development drilling resulted in 179 oil wells, 9 gas wells and 96 dry holes.

New fields found during 1966 include the Reserve Field in eastern Montana. This field has the deepest production in the State from the Red River at 11,100 feet. The largest discovery of reserves was a new pay discovery in the Madison in Lookout Butte Field in southeast Montana. In central Montana new fields discovered were the Weed Creek Field with Amsden production and the Kelley Field with Tyler production. There were two rather small discoveries in northwest Montana. They were the Miners Coulee and Rattlesnake Coulee Fields.

Development drilling was at almost the same record pace as during the previous year. Most development drilling was in northwest Montana. In this area there were many wells classified as development wells, because they were within the northern boundary of the Cut Bank Field, that were actually exploration wells in a large undrilled area. Development drilling continued in southeast Montana along the Cedar Creek Anticline and in northeast Montana in Flat Lake and Goose Lake. There was a small amount of development drilling in central Montana.

Four waterfloods were started during 1966 and a total of 33 waterfloods are now in operation. The Commission approved 5 waterfloods and 2 of these have commenced water injection during the year.



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FIVE YEAR SUMMARY

	1962	1963	1964	1965	1966
Production, Northern Montana—Bbls.	4,252,304	4,530,510	5,705,948	6,826,261	7,991,302
South Central—Bbls.	3,851,672	3,383,587	3,699,927	3,597,647	3,392,890
Central—Bbls.	5,279,163	3,950,490	3,269,768	2,849,923	2,710,194
Williston Basin—Bbls.	18,264,368	19,005,066	17,971,855	19,504,287	21,285,732
TOTAL	31,647,507	30,869,653	30,647,498	32,778,118	35,380,118
No. of Producing Wells, Northern Montana	2,615	2,550	2,216	2,649	2,308
South Central	88	82	88	101	106
Central	333	310	317	306	301
Williston Basin	656	700	708	754	792
TOTAL	3,692	3,642	3,329	3,810	3,507
Average Daily Production/Well—BOPD,					
Northern Montana	4.5	4.9	7.4	7.1	9.5
South Central	119.9	113.4	115.1	97.6	87.7
Central	43.4	34.8	28.8	25.5	24.7
Williston Basin	76.3	74.4	65.7	70.9	73.6
STATE AVERAGE	23.5	23.2	25.2	23.6	27.6
Development Wells Drilled, Oil Wells	182	131	100	177	179
Gas Wells	16	6	7	9	9
Dry Holes	57	60	109	107	96
TOTAL	255	197	216	293	284
Exploratory Wells Drilled, Oil Wells	8	8	22	14	10
Gas Wells	2	5	3	1	3
Dry Holes	154	152	150	199	185
TOTAL	164	165	175	214	198
TOTAL WELLS DRILLED	419	362	391	507	482
TOTAL FOOTAGE DRILLED	2,415,856	1,906,976	1,863,155	2,328,865	2,211,369
AVERAGE DEPTH OF ALL WELLS	5,765	5,268	4,765	4,593	4,588

SUMMARY OF DRILLING BY COUNTIES—1966
STATE OF MONTANA

County	Wildcats			Development			Total Wells		Avg. Depth Per Well
	Dry	Oil	Gas	Dry	Oil	Gas	Drilled	Footage Drilled	
Big Horn	6	0	0	1	2	0	9	49,271	5,475
Blaine	1	0	0	0	0	1	2	5,250	2,625
Carbon	2	0	1	3	3	0	9	42,684	4,743
Carter	4	0	0	0	0	0	4	10,341	2,585
Chouteau	2	0	0	0	0	0	2	6,021	3,011
Custer	2	0	0	0	0	2	4	21,252	5,313
Daniels	3	0	0	0	0	0	3	29,682	9,894
Dawson	2	0	0	1	6	0	9	84,399	9,378
Fallon	1	0	0	2	28	0	31	272,757	8,799
Garfield	5	0	0	0	0	0	5	33,111	6,622
Glacier	11	1	0	12	37	2	63	205,135	3,256
Hill	9	0	1	0	0	1	11	39,841	3,622
Liberty	15	0	0	8	8	1	32	92,488	2,890
McCone	10	0	0	2	5	0	17	116,112	6,830
Musselshell	7	1	0	5	4	0	17	83,678	4,922
Petroleum	1	0	0	0	1	0	2	7,898	3,949
Phillips	2	0	0	0	0	0	2	8,175	4,088
Pondera	5	1	0	0	12	0	18	49,748	2,764
Powder River	3	0	0	2	1	0	6	32,722	5,454
Prairie	1	0	0	0	4	0	5	46,653	9,331
Richland	3	1	0	1	1	0	6	68,907	11,485
Roosevelt	5	1	0	3	2	0	11	85,947	7,813
Rosebud	4	0	0	6	2	0	12	60,250	5,021
Sheridan	16	2	0	8	22	0	48	338,592	7,054
Stillwater	2	0	0	0	0	0	2	10,055	5,028
Sweetgrass	1	0	0	0	0	0	1	6,266	6,266
Teton	6	0	0	1	1	0	8	18,663	2,333
Toole	53	2	1	41	37	2	136	336,085	2,471
Valley	2	0	0	0	0	0	2	12,142	6,071
Wheatland	1	0	0	0	0	0	1	6,390	6,390
Wibaux	0	0	0	0	2	0	2	18,275	9,138
Yellowstone	0	1	0	0	1	0	2	12,579	6,290
TOTALS	185	10	3	96	179	9	482	2,211,369	4,588

TOTAL
96.932

CRUDE OIL PRODUCTION 1942-1966

PERCENT
60.2

WILLISTON
BASIN

SOUTH
CENTRAL
MONTANA

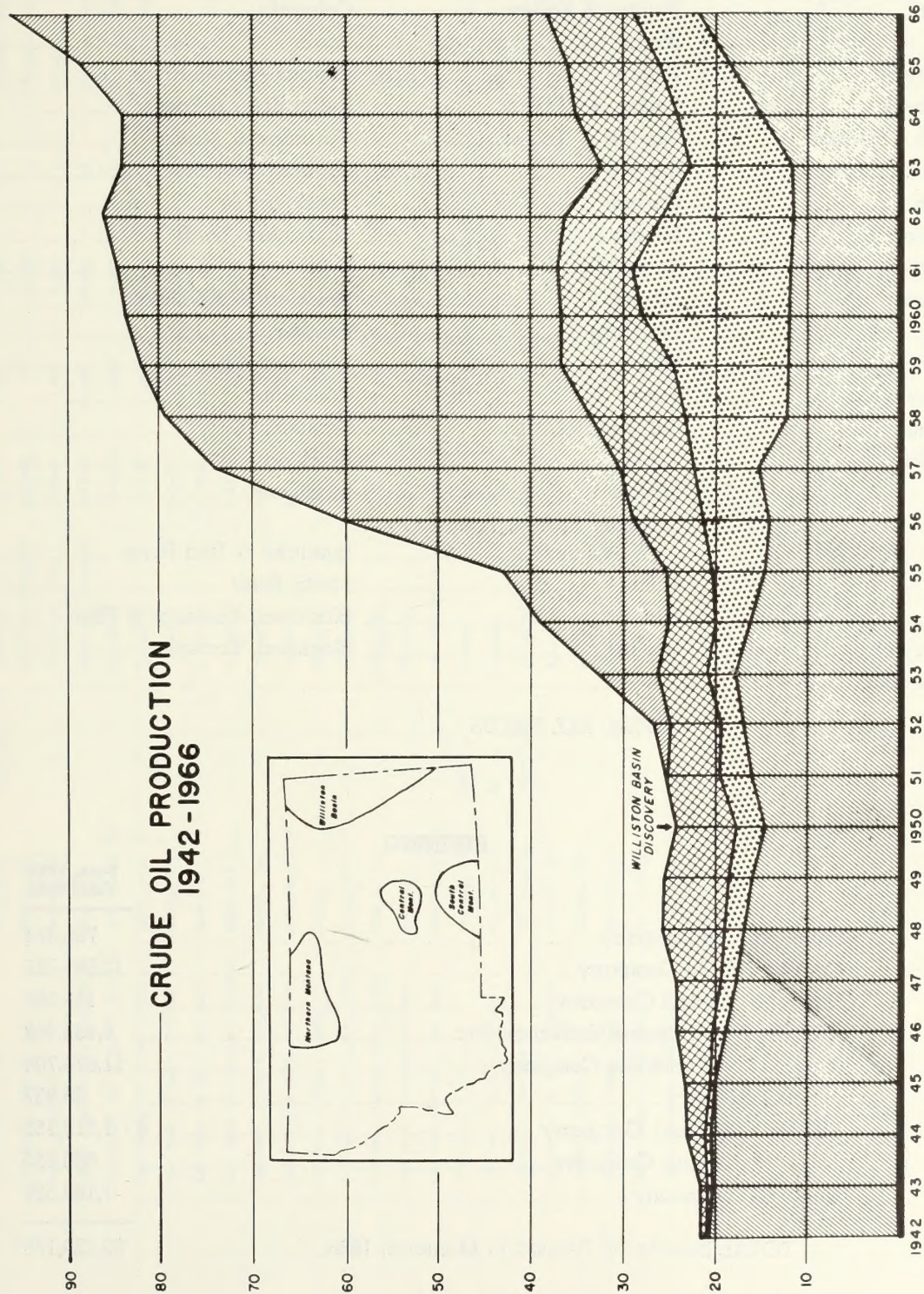
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CENTRAL
MONTANA

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NORTHERN
MONTANA

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B.O.P.D. (THOUSANDS)

MONTANA
GAS PRODUCTION DATA — 1966

Field	County	Producing Formation	1966 Production MCF
Big Coulee	Golden Valley & Stillwater	Lakota & Morrison	986,774
Bowdoin	Phillips & Valley	Colorado	2,148,063
Bowes	Blaine	Eagle	579,397
Cabin Creek	Fallon	Interlake & Red River	1,213,957
Cedar Creek	Fallon & Wibaux	Judith River & Eagle	3,449,124
Cut Bank & Reagan	Glacier & Toole	Cut Bank & Madison	8,253,797
Dry Creek	Carbon	Eagle & Frontier	1,072,851
Elk Basin	Carbon	Tensleep	1,572,634
Flat Coulee	Liberty	Blackleaf & Swift	81,390
Gold Butte	Toole	Swift	26,282
Grandview	Liberty	Blackleaf & Kootenai	64,439
Hardin	Big Horn	Frontier	41,005
Keith Block	Liberty	Blackleaf & Sawtooth	4,763,980
Kevin Sunburst	Toole	Kootenai	691,637
Lake Basin	Stillwater	Frontier	1,250,815
Middle Butte	Toole	Blackleaf	61,923
Mt. Lilly	Liberty	Madison	361,486
Pine	Dawson, Prairie, Fallon & Wibaux	Interlake & Red River	777,581
Plevna	Fallon	Judith River	160,400
Utopia	Liberty	Blackleaf, Kootenai & Ellis	991,782
Whitlash	Liberty	Blackleaf, Kootenai	1,882,656
Miscellaneous			1,346,174
TOTAL ALL FIELDS			31,778,147

REFINING

	Year, 1966 Total Bbls.
Big West Oil Company	765,374
Continental Oil Company	10,595,051
Diamond Asphalt Company	165,336
Farmers Union Central Exchange, Inc.	6,494,402
Humble Oil & Refining Company	11,874,704
Jet Fuel Refinery	65,937
Phillips Petroleum Company	1,619,158
Tesoro Petroleum Company	680,655
Union Oil Company	1,168,559
TOTAL Barrels Oil Refined in Montana, 1966	33,429,176

SUMMARY OF ACTIVE SECONDARY RECOVERY PROJECTS (DATE EFFECTIVE TO JANUARY 1, 1967)

Field, Formation	Operator	Type or Project	Injection Pattern	Date Injections Commenced	Cumulative Injections 1000's Bbls. or MCF	Dec. 1966 Avg. Daily Injection Rate	No. of Injection Wells	Source of Injection Media & Remarks
Ash Creek, Shannon	McDermott	Waterflood	Periphal	10-15-64	246	308	4	Parkman, Data for Montana portion.
Big Wall, Tyler B	Texaco, Inc.	"	Modified Periphal	8-20-66	735	5,662	3	Produced water from Ansden & Tyler
Bowes, Sawtooth	Texaco, Inc.	"	Dispersed Pilot	5-23-61	1,440	2,077	5	Madison
Cabin Creek, Siluro-Ordovician	Shell Oil	"	Modified Periphal	6-12-59	14,336	18,433	15	Produced Water & Fox Hills
Cat Creek, 1st & 2nd CC (Unit 1)	Continental Oil	"	Periphal	10-10-62	4,468	3,793	4	Third Cat Creek
Cat Creek, 1st & 2nd CC (Unit 2)	Continental Oil	"	Periphal	12-1-59	13,861	4,149	8	Third Cat Creek
Cut Bank, NE Unit, Cut Bank	Texaco, Inc.	"	5-Spot	9-2-63	4,699	6,573	39	Madison
Cut Bank, NW Unit, Cut Bank	Humble Oil	"	5-Spot	1-30-62	5,661	6,229	32	Madison
Cut Bank, So. Central, Cut Bank	Union Oil	"	5-Spot	5-63	7,570	4,568	27	Madison
Cut Bank, SE Unit, Cut Bank	Texaco, Inc.	"	5-Spot	4-62	10,585	11,259	47	Madison
Cut Bank, SW Unit, Cut Bank	Phillips Petr.	"	5-Spot	9-62	4,798	6,034	27	Madison
Cut Bank, Tribal, Lander	Humble	"	Dispersed	6-51	4,173	382	4	Eagle
Cut Bank, H. C. Lander, Lander	Humble Oil	"	Dispersed	4-65	303	483	2	Eagle
Cut Bank, Lander Sand, Lander	Texaco, Inc.	"	Dispersed	7-64	1,008	1,271	7	Eagle
Cut Bank, McGuiness-Moulton	Union Oil	"	Dispersed	12-62	1,152	1,115	2	Madison
Cut Bank, SW Ext., Cut Bank	Continental Oil	"	One Well Pilot	12-63	288	184	1	Madison
Elk Basin, Frontier	Pan American	Gas, Inc.	Crestal	1926	All injection wells in Wyoming			Purchased Gas
Elk Basin, Embarras-Tensleep	Pan American	Gas Inj.	Crestal	1949	All injection wells in Wyoming			Inert Gas
Elk Basin, Madison	Pan American	Waterflood	Periphal	1962	14,571	4,320	4	Madison
Elk Basin, NW Unit, Frontier	Sinclair Oil	"	Periphal	10-57	3,443	1,501	4	Madison
Ivanhoe, Tyler	Ivanhoe Petr.	"	Dispersed Pilot	7-64	135	--	1	Alluvial Sands
Keg Coulee, West, Tyler B	Pan American	"	One Well Pilot	8-31-66	201	1,540	1	Madison
Kevin-Sunburst, Madison	Lon Crumley	"	Dispersed	9-63	226	202	1	Madison
Kevin-Sunburst, Madison	Texaco, Inc.	"	Periphal	8-64	1,408	1,484	11	Madison
Kevin-Sunburst, Madison	Juniper Oil	"	Dispersed	8-64	139	203	1	Madison
Kevin-Sunburst, Madison	Cardinal Petr.	"	Dispersed	6-65	137	414	2	Madison
Little Beaver, Siluro-Ord.	Shell Oil	"	Semi-Periphal	8-7-66	670	5,003	7	Minnelusa
Little Beaver East, Siluro-Ord.	Shell Oil	"	Semi-Periphal	4-65	1,210	3,252	5	Minnelusa
Mosby Dome, Morrison	Musselshell Oil	"	One Well Pilot	12-65	26	--	1	Third Cat Creek
Pine, Siluro-Ordovician	Shell Oil	"	Semi-Periphal	3-59	30,218	19,430	31	Fox Hills & Produced Water
Pondera, Madison	Phillips Petr.	"	Dispersed	8-61	723	205	2	Madison
Ragged Point, Tyler A	Juniper Oil	"	Modified Periphal	2-3-66	886	2,526	5	Third Cat Creek
Reagan, Madison	Union	Gas Inj.	Crestal	8-61	1,771	738	4	Produced Gas
Red Creek, Cut Bank	Humble	Waterflood	5-Spot	6-65	1,020	2,900	9	Madison
Richey SW, Dawson Bay-Interlake	Sinclair	"	One Well Pilot	12-65	293	440	2	Fox Hills
Stensvad, Tyler B	Pan American	"	Periphal	2-63	5,837	6,673	5	Mission Canyon

OIL AND GAS DISCOVERIES IN 1966

County	Operator—Well Name and Location	Field	Total Depth	Oil B/D	Initial Potential Gas (MCF)	Producing Formation
Carbon	Develop. Serv., Brown-Foothills 1, NW NW 4-6S-18E	Unnamed	2,610		700	Lakota (1)
Fallon	Shell Oil, NP 31X-5, NW NE 5-6N-60E	Lookout Butte	8,860	163 (P)		Lodgepole (2)
Glacier	Mont. Power, Frary-Scriver 1, C SW 1/4 18-37N-8W	Unnamed	4,725	4 (F)	300	Sun River
Glacier	Mont. Power, Elmer 1, NE NW 3-36N-5W	Cut Bank	3,070		2,000	Moulton (2)
Hill	Pan American, Lineweaver 1, NE NE 4-36N-8E	Unnamed	3,520		7,300	Piper
Liberty	Cardinal, State 15-8, SW SE 8-37N-5E	Flat Coulee	2,828		1,105	Dakota (2)
Musselshell	McAlester, NPRR 1, NE NE 13-10N-28E	Kelley	4,404	258 (F)		Tyler
Pondera	Balcron Oil, O'Brien 2, NW NE NW 13-27N-3W	Unnamed	1,989	6 (P)		Sunburst
Richland	J. A. Ihli, Magruder 1, SW NE NE 11-24N-55E	Unnamed	11,910	480 (F)		Red River
Roosevelt	Murphy Oil, White Mountain 1, N 1/2 NE 1/4 28-31N-48E	N. E. Benrud	7,801	60 (P)		Nisku
Sheridan	Chevron, Ferguson 1, NE SE 30-37N-58E	So. Flat Lake	6,640	67 (P)		Ratcliffe
Sheridan	Farmers Union, Aasheim 1, SW NE NE 29-33N-56E	Reserve	11,577	326 (F) 692 (F)		Interlake Red River (3)
Toole	Wm. Fulton, McCutcheon 1, NE NE 16-36N-2E	Miner's Coulee	2,518	48 (P)		Sunburst
Toole	John Batts, State 13-16, SW SW 16-36N-3W	Rattlesnake Coulee	2,000	90 (P)		Sunburst
Toole	Wm. Fulton, State 31-23, SW SW 23-37N-4W	Unnamed	2,670		860	Cut Bank
Yellowstone	A. J. Hodges, Maart 1, NW NW 2-7N-31E	Weed Creek	6,300	288 (F)		Amsden

(1) Re-entry

(2) New Pool Discovery

(3) Dual Completion

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
ARCH APEX Blackleaf (Gas) (Crete.)	13	Strat.	Volumetric	(Blackleaf Gas Pool) 330' from legal subdivision; 2500' from any other drilling or producible gas well producing from the same reservoir; 75' topographic tolerance. (Order 4-60.)	None
ASH CREEK Shannon (Upper Cret.)	8	Anticline	Partial Water Drive and Depletion	Spacing waived within unitized portion of field except no well may be drilled closer than 660' from unit boundary. (Order 4-65.)	Waterflood started in July, 1964
BANNATYNE Swift (Jurassic)	6	Anticline	Comb. Water Drive and Volumetric	Center of 10-acre tracts, 50' topographic tolerance. Commingling permitted. (Order 20-58.)	Pilot waterflood of Swift suspended in 1963.
Madison (Miss.)	3	Anticline	Water Drive		
BASCOM Tyler (L. Penn.)	1	Structural	Depletion	State-wide. (Order 10-63.)	None
BEARS DEN Kootenai (L. Cret.)	6 /	Anticline	Depletion and Gas Cap Drive	State-wide.	None
BELFRY Fuson (L. Cret.)	1	Strat.	Depletion	State-wide. Abandoned 6-66.	None
BENRUD Nisku (Devonian)	1	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted location within a 1320' square in center of quarter section. (Order 6-65.)	Water disposal into Judith River formation. (Order 64-62.)
BENRUD, EAST Nisku (Devonian)	1	Structural	Water Drive	(Nisku) Same as Benrud Field. (Order 6-65.)	None
BENRUD, NORTHEAST Nisku (Devonian)	2	Structural	Water Drive	(Nisku) Same as Benrud Field. (Order 6-65.)	None
BEDTHELOTE Sunburst (L. Cret.)	1	Strat.	Depletion	(Sunburst) 40-acre spacing units with well no closer than 330' from a lease or property line and not closer than 660' between wells. (Order 18-66.)	None
BIG COULEE 3rd Cat Creek (L. Cret.)	3	Structural	Water Drive	State-wide.	None
Morrison (U. Jur.)	3	Structural	Water Drive		
BIG WALL Amsden (Penn.)	7	Structural	Water Drive	Amsden & Basal Amsden (Tyler) spaced by old state-wide spacing; 330' from lease or property line, 990' between wells in same reservoir. (Order 12-54.)	Previous disposal into Tyler stopped in 1961. Waterflood of Tyler started August, 1966.
Tyler (Penn.)	17	Strat.	Depletion		
BLACKFOOT Cut Bank (L. Cret.)	5	Strat.	Depletion	(Cut Bank and Madison). One well only per 40-acre spacing unit; 300' tolerance from center of spacing unit. Dual completion in Cut Bank & Madison with administrative approval.	None
Madison (Miss.)	7	Structural	Water Drive		

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
BLACKFOOT, EAST Cut Bank (L. Cret.)	1	Strat.	Depletion	(Cut Bank.) 40-acre spacing units. Location no closer than 330' from spacing unit boundary. (Order 41-65.)	None
BORDER Cut Bank (L. Cret.)	6	Strat.	Depletion	(Moulton, Sunburst & Cut Bank) Oil: 220' from boundary of legal subdivision & 430' between wells in same formation; 75' topographic tolerance. Gas: 330' from boundary of legal subdivision. 2400' between wells in same formation on same lease. 75' topographic tolerance. (Order 7-54.)	None
Moulton (L. Cret.)	13	Structural	Depletion		
BOWDOIN (Gas) Bowdoin & Phillips sands in Colorado (Cret.)	349	Structural	Volumetric	(Gas only.) One well per quarter section not less than 1000' from lease boundary or less than 2000' from any gas well in same horizon. (Order 29-55.)	None
BOWES Eagle (U. Cret.) (Gas)	21	Structural	Volumetric	(Eagle & Virgelle) (Gas) 660' from boundary of legal subdivision, 1320' from other wells in same formation. 75' topographic tolerance. (Order 23-54.)	None
Sawtooth (Jurassic)	59	Structural	Partial Water Drive	(Sawtooth.) 330' from lease or property line, 990' between wells in same formation. (Order 13-54.)	Pilot waterflood initiated in 1961 and expanded to field-wide waterflood in 1965.
BRADY Sunburst (L. Cret.)	5	Strat.	Depletion	(Brady Sand Pool.) 10-acre spacing units with 75' topographic tolerance from center of spacing unit. (Order 34-62.)	None
CABIN CREEK Mission Canyon (Miss.)	19	Structural	Water Drive	Spacing waived and General Rules No. 213 (Deviation), 218 (Commingling), and 219 (Dual Completion) are suspended until present Unit Agreement becomes operative. (Order 36-62.)	Waterflood of Siluro-Ordovician reservoir has been expanded to a full scale peripheral flood. Some produced water not used in waterflood is disposed into Mission Canyon. (Order 60-62.)
Interlake (Silurian)	}82	Structural	Depletion		
Red River (Ordovician)					
CAT CREEK Kootenai (L. Cret.)	93	Structural	Depletion	(Kootenai, Morrison & Ellis.) 220' from lease or property line, 440' from every other well in same formation. (Order 17-55.)	Two waterflood units are operating in the West Dome. In Mosby Dome one small pilot waterflood is in progress and another waterflood was approved in 1966.
Morrison (U. Jur.)	7	Structural	Depletion		
Ellis (U. Jur.)	45	Structural	Depletion		
CEDAR CREEK Judith River (Gas)	176	Structural	Volumetric	(Judith River) Gas: 1200' from legal subdivision line, 2400' from every other well in same formation. (Order 33-54.)	None
Eagle (U. Cret.)	62	Structural	Volumetric	(Eagle.) 320-acre spacing units. Wells in center of NW ¹ / ₄ and SE ¹ / ₄ of each section with 200' topographic tolerance. (Order 1-61.)	None
CONRAD, SOUTH Dakota (L. Cret.)	7	Strat.	Depletion	(Dakota) 10-acre spacing units. Wells in center of each unit with 75' topographic tolerance. (Orders 34-62 & 31-63.)	None

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules		Secondary Recovery or Water Disposal
CUPTON Red River (Ordovician)	1	Structural	Water Drive	(Red River) 80-acre spacing units consisting of E1/2 & W1/2 of quarter section; well location in SE1/4 & NW1/4 of quarter section with 75' topographic tolerance. (Order 31-55.)	None	
CUT BANK Kootenai (L. Cret.)	1,139	Strat.	Depletion	(Moulton, Sunburst, Cut Bank, Madison) Oil: 330' from legal subdivision line. 650' between wells in same formation. 5-spot on 40-acre tract permitted. 75' topographic tolerance. (Order 10-54.)	There are 10 Kootenai sand waterfloods in progress.	
Madison (Miss.)	39	Strat.	Water Drive	Gas: 330' from legal subdivision, 2400' between wells in same formation. 75' topographic tolerance. (Order 10-54.)		
DEER CREEK Interlake (Silurian)	2	Structural	Water Drive	(Interlake and Red River) 80-acre spacing units consisting of any two adjacent quarter-quarter sections. Well location in NE1/4 and SW1/4 of each quarter section with 75' topographic tolerance. (Orders 23-55 & 14-59.)	Excess produced water is disposed into Dakota and Lakota formations. (Orders 6-56 & 3-58.)	
Red River (Ordovician)	1	Structural	Water Drive	Commingling of production permitted upon approval of Comm. Petr. Engr. (Order 18-63.)		
DELPHIA Amsden (Penn.)	1	Structural	Water Drive	State-wide	None	
DEVILS BASIN Heath (U. Miss.)	Shut-in	Structural	Depletion	State-wide	None	
DEVON (Gas) Blackleaf (L. Cret.)	Shut-in	Strat.	Volumetric	State-wide	None	
DRY CREEK Frontier (U. Cret.) (Gas)	1	Structural	Volumetric	State-wide spacing.	None	
Eagle (L. Cret.) (Gas)	1	Structural	Volumetric			
Greybull (L. Cret.) (Gas)	1	Structural	Volumetric			
Greybull (Cret.) (Oil)	11	Structural	Depletion			
DWYER Mission Canyon (Miss.)	15	Structural	Water Drive	(Madison) 160-acre spacing units; well location in SE1/4 of spacing unit with 75' topographic tolerance. (Orders 25-60, 29-61.)	Produced water disposed into Dakota formation. (Order 26-63.)	
ELK BASIN (Mont. Portion) Frontier (U. Cret.)	5	Structural	Gravity Drainage	Rule No. 203 (Spacing) is waived within Unit Area. (Order 10-61.)	Frontier: Crestal gas injection. Embar-Tensleep: Pressure maintenance by crestal gas in injection. Waterflood approved in 1966. Madison: Water injection. Jefferson: None.	
Embar-Tensleep (Perm., Penn.)	26	Structural	Gravity Drainage			
Madison (Miss.)	23	Structural	Water Drive			
Jefferson (Dev.)	1	Structural	Water Drive			
ELK BASIN, NORTHWEST Frontier (U. Cret.)	8	Structural	Depletion	Spacing waived within unitized portion except that bottom of hole be no closer than 330' from unit boundary and there be at least 1320' surface distance between wells in same formation; 75' topographic tolerance. (Orders 43-63, 28-64.)	Frontier: Waterflood in progress. Embar - Tensleep: Waterflood project approved in January, 1967. Madison: None.	
Embar-Tensleep (Perm., Penn.)	6	Structural	Gravity Drainage			
Madison (Miss.)	2	Structural	Water Drive			

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
FAIRVIEW Red River (Ordovician)	2	Structural	Water Drive	(Red River) 160-acre spacing unit. Well location anywhere in spacing unit but no closer than 660' from unit boundary. (Orders 48-65, 1-67.)	None
FERTILE PRAIRIE Red River (Ordovician)	3	Structural	Water Drive	(Red River) 80-acre spacing units consisting of north-south rectangular units. Well location in NW 1/4 and SE 1/4 of quarter section with 75' topographic tolerance. (Orders 3-56, 7-62.)	None
FLAT COULEE Bow Island (Cret.) (Gas)	4	Structural and Strat.	Depletion	(Bow Island) Gas: 330' from boundary of legal subdivision and 1320' from other wells in same reservoir. (Order 16-55.)	None
Dakota (Cret.) (Gas)	1	Structural and Strat.	Depletion	(Dakota) State-wide.	
Swift (Jur.) (Gas)	Shut-in	Structural and Strat.	Depletion	(Swift) Gas: State-wide gas spacing.	
Swift (Jur.) (Oil)	33	Structural and Strat.	Depletion	(Swift) Oil: 40-acre spacing units. Well in center of spacing unit with 150' topographic tolerance. (Orders 16-62, 19-63.)	
FLAT LAKE Madison-Ratcliffe (Miss.)	54	Structural and Strat.	Partial Water Drive	(Ratcliffe) 160-acre spacing units; well location in center of NE 1/4 of quarter section with 200' topographic tolerance. Wells no closer than 961' to No. Dakota state line and no closer than 1600' to Canadian line. (Orders 10-65 amended and 43-65.)	Excess produced water disposed into Muddy, Dakota, or Lakota formations. (Orders 39-64, 39-66.)
FLAT LAKE, SOUTH Madison-Ratcliffe (Miss.)	1	Structural and Strat.	Partial Water Drive	(Ratcliffe) Same as Flat Lake spacing. (Order 2-67.)	None
FRANNIE (Mont. Portion) Tensleep (Penn.)	2	Structural	Comb. Water Drive and Gravity Drainage	(Tensleep) 10-acre spacing units; well location in center of each unit with 100' topographic tolerance. (Order 35-63.)	None
FRED & GEORGE CREEK Sunburst (L. Cret.)	22	Strat.	Depletion	(Sunburst) Oil: 40-acre spacing units; well location in center of unit with 250' topographic tolerance. (Orders 29-63, 1-65.)	None
Swift (U. Jur.)	17	Strat.	Depletion	(Swift) State-wide.	
GAGE Madison (Miss.)	1	Structural	Water Drive	State-wide.	None
GAGE, SOUTHWEST Amsden (Penn.)	1	Unknown	Water Drive	Temporary 160-acre spacing expired. State-wide spacing now applies. (Order 50-65.)	None
GAS CITY Red River (Ordovician)	28	Structural	Water Drive	80-acre spacing units consisting of E 1/2 and W 1/2 of quarter sections; well location in NW 1/4 and SE 1/4 of quarter section; 150' topographic tolerance. Spacing waived and state-wide rules 213 (Deviation), 218 (Commingling) and 219 (Dual Completion) are waived in unitized portion of field. (Order 29-62.)	Excess produced water disposed into Judith River formation and into Red River formation below oil-water contact. (Orders 32-61, 20-64.)

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules		Secondary Recovery or Water Disposal
GLENDIVE Stony Mountain, Red River (Ordovician)	12	Strat. and Structural	Water Drive	(Stony Mountain, Red River) 80-acre spacing units consisting of any two adjacent quarter-quarter sections; wells located in center of NE $\frac{1}{4}$ and SW $\frac{1}{4}$ of each quarter section with 75' topographic tolerance. (Orders 27-55, 19-62, 58-62, 20-66.)		Excess produced water disposed into Swift formation. (Orders 16-56, 16-63.)
GOOSE LAKE Ratcliffe (Miss.)	23	Structural and Strat.	Partial Water Drive	(Ratcliffe) 160-acre spacing units; well locations according to areas: Area I, center of NW $\frac{1}{4}$ of quarter section; Area II, center of SE $\frac{1}{4}$ of quarter section; Area III, center of NE $\frac{1}{4}$ of quarter section. 200' topographic tolerance. (Orders 42-63, 40-66.)		Excess produced water disposed into Lakota, Mission Canyon, Dakota, and Muddy formations. (Orders 12-64, 14-66.)
GRABEN COULEE Sunburst (L. Cret.)	0	Structural and Strat.	Depletion	(Sunburst) Oil: 40-acre spacing units; well location no closer than 330' from legal subdivision.		None
Cut Bank (L. Cret.)	20	Structural and Strat.	Depletion	(Cut Bank and Madison) Oil: 330' from boundary of legal subdivision and 650' from other well in same reservoir and on same lease. 75' topographic tolerance. (Order 73-62.)		
Madison (Miss.)	22	Structural and Strat.	Depletion			
GRANDVIEW Blackleaf (Cret.) (Gas) Swift (U. Jur.)	Shut-in 2	Structural Structural	Unknown Unknown	State-wide spacing. State-wide spacing.		None None
GYPSY BASIN Sunburst (L. Cret.)	3	Structural and Strat.	Comb. Water Drive and Depletion	(Sunburst) Oil: 330' from lease lines and 660' between wells in same formation. Only two wells per quarter-quarter section. (Order 7-66.)		Order 6-64 permits injection of excessive gas (produced with oil) into the Sunburst gas cap.
Swift (U. Jur.)	1	Structural and Strat.	Comb. Water Drive and Depletion	(Swift) Oil: Same as Sunburst.		
Sawtooth-Madison (Jur. & Miss.)	5	Structural and Strat.	Comb. Water Drive and Depletion	(Sawtooth-Madison) Oil: 40-acre spacing units; wells no closer than 330' from lease line. (Order 7-66.) (Sunburst and Madison) Gas: 160-acre spacing units; well locations in center of any quarter-quarter section in each 160-acre unit. 2340' between gas wells. 150' topographic tolerance. (Order 13-59.)		
HARDIN Frontier (Cret.)	38	Strat.	Volumetric	State-wide.		None
HIBBARD Amsden (Penn.)	1	Unknown	Water Drive	State-wide.		None
IVANHOE Morrison (U. Jur.)	1	Structural and Strat.	Depletion	40-acre spacing unit for production from any one common formation; well location in center of unit with 200' topographic tolerance. (Order 7-60.)		Waterflood of Tyler B & C sands was started in July, 1964. (Order 19-64.)
Amsden (L. Penn.)	2	Structural and Strat.	Water Drive			
Tyler (L. Penn.)	9	Structural and Strat.	Depletion			
KEG COULEE Tyler (Penn.)	21	Strat.	Depletion	(Tyler) 40-acre spacing in southwest portion of field except that spacing is waived in unitized portion. (Orders 3-64, 4-64, 23-64.) 80-acre spacing in remainder of field with variable pattern. (Orders 11-60, 28-62.) Topographic tolerance varies from 100' to 150'. (Orders 11-60, 4-64, 23-64.) Buffer zone waived. (Order 16-65.)		A waterflood of Tyler C sand in the unitized northwest portion of the field was commenced in August, 1967. (Orders 3-64, 28-66.)

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
KEG COULEE, NORTH Tyler "B" (Penn.)	3	Strat.	Depletion	40-acre spacing units; well location in center of spacing unit with 150' topographic tolerance. (Order 46-64.) Buffer zone waived. (Order 16-65.)	None
KEITH, EAST (Gas) Blackleaf & Sawtooth (Gas) (Cret. & Jur.)	12	Structural	Water Drive	(Blackleaf & Sawtooth) State-wide gas spacing except in unitized portions that were spaced by Order 22-62.	None
KELLEY Tyler (Penn.)	2	Strat.	Depletion		None
KEVIN-SUNBURST Madison, Sunburst (Miss., L. Cret.)	729	Strat.	Depletion	9 wells per 40-acre tract; only 3 wells on any side of tract set back at least 220' from line. Field delineated by Orders 8-54, 28-55.	There are four waterfloods in operation.
LAKE BASIN, NORTH Eagle, Frontier (Cret.)	4	Structural	Unknown	(Frontier, Eagle) Gas: 640-acre gas spacing units consisting of one section. Well locations in center of NW¼ or SE¼ of each section with 75' topographic tolerance. (Order 6-58.)	None
LITTLE BEAVER (Mont. Portion) Red River (Ordovician)	30	Structural	Comb. Depletion and Water Drive	Spacing waived and General Rules No. 213 (Deviation), 218 (Commingling) and 219 (Dual Completion) are suspended until present Unit Agreement becomes inoperative. (Order 41-62.)	Waterflood of the Red River was commenced in August, 1967.
LITTLE BEAVER, EAST (Mont. Portion) Red River (Ordovician)	13	Structural	Comb. Depletion and Water Drive	Same as for Little Beaver. (Order 42-62.)	Waterflood of the Red River was commenced in April, 1965.
LODGE GRASS Teensleep (Penn.)	3	Structural	Water Drive	(Teensleep) 160-acre spacing units; well locations vary according to areas; 250' topographic tolerance. (Orders 26-64, 26-65.)	None
LOOKOUT BUTTE Madison (Miss.) Silurian (Ordovician)	12 70	Structural Structural	Water Drive Comb. Depletion and Water Drive	(Madison) State-wide spacing. (Silurian-Ordovician) 160-acre spacing; well location in center of SE¼ of each quarter section with 150' topographic tolerance. (Order 21-62.) Coral Creek Unit not subject to spacing rules. Re-delineated per order 7-63.	Water disposal into Madison. (Order 68-62.) Waterflood of Silurian - Ordovician in Coral Creek Unit approved in 1966. (Order 35-66.)
MASON LAKE Lakota (Cret.)	2	Structural	Water Drive	State-wide.	None
MELSTONE Tyler (Penn.)	5	Structural and Strat.	Depletion	State-wide.	None
MIDDLE BUTTE Blackleaf (Cret.) (Gas)	4	Structural	Volumetric	(Bow Island) Gas: 320-acre spacing units consisting of E½ & W½ of each section; well location in center of either of the inside quarter-quarter sections located in E½ of each spacing unit. 75' topographic tolerance. (Order 3-66.)	None

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
MINERAL BENCH Charles "C" Duperow (Miss. & Dev.)	1	Structural	Water Drive	State-wide spacing.	Water disposal into Dakota-Lakota per Order 18-65.
MINERS COULEE Swift (U. Jur.)	6	Strat.	Depletion	(Sunburst-Swift) 40-acre spacing units consisting of quarter-quarter sections; well location no closer than 330' from lease or property line and 660' from any other well.	None
MONARCH Madison (Miss.)	2	Structural and Strat.	Water Drive	(Madison) 80-acre spacing units consisting of east and west halves of quarter section. Well location in SW $\frac{1}{4}$ & NE $\frac{1}{4}$ of quarter section. Location with 660' square at center of quarter-quarter section. (Order 18-61.)	Produced water is disposed in- to the salt water disposal sys- tem for the Pennel Field.
Interlake, Red River (Silurian, Ordovician)	11	Structural and Strat.		(Siluro-Ordovician) 160-acre spacing units consisting of a quarter section; well location in center of SW $\frac{1}{4}$ of quarter section with 175' topographic tolerance. (Orders 12-59, 4-63.)	
MOSSER Dakota (L. Cret.)	9 /	Structural	Water Drive	Spacing waived. Future development requires administra- tive approval of the Commission. (Order 27-62.)	None
MT. LILLY Madison (Miss.) (Gas)	2	Structural	Water Drive	(Madison) Gas; 640-acre, well location in approximate center of any of the four quarter-quarter sections adjoin- ing center of section; 250' topographic tolerance. (Order 37-63.)	None
OUTLOOK Duperow (Dev.)	2	Strat. and Structural	Water Drive	(Duperow) State-wide spacing.	Produced water is disposed into Dakota, Newcastle, and Siluro- Devonian formations. (Orders 16-59, 17-65, 36-66.)
Silurian-Devonian	9	Strat. and Structural	Water Drive	(Winnipegosis & Interlake) 160-acre spacing units; well location in center of either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ of each quar- ter section; 175' topographic tolerance. (Order 19-59A.)	
OUTLOOK, SOUTH Winnipegosis (Dev.)	2	Structural	Water Drive	(Red River & Interlake-Winnipegosis) 160-acre spac- ing; permitted wells in either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ of quarter section; 175' topographic tolerance. (Order 19-59A.)	Produced water disposed into Dakota, Newcastle formations. Orders 19-59, 17-65.)
Red River (Ordovician)	1	Structural	Water Drive		
OUTLOOK, WEST Winnipegosis (Dev.)	2	Structural	Water Drive	(Winnipegosis) 160-acre spacing units consisting of quarter sections; permitted wells in either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ with a tolerance of 175'. (Order 7-67.)	Produced water disposed into Dakota formation. (Order 42-66.)
PENNEL Madison (Miss.)	8	Structural	Water Drive	(Madison) 80-acre spacing units consisting of east and west half of quarter section; wells located in center of SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of quarter sections with 150' topo- graphic tolerance. (Order 15-61.)	Produced water is being in- jected into Siluro - Ordovician, Dakota, and Madison forma- tions. (Orders 16-60, 46-62, 68-62, 36-63, 13-64.)
Siluro-Ordovician	104	Structural	Comb. Depletion and Water Drive	(Siluro-Ordovician) 80-acre spacing units on west side and 160-acre spacing units on east side of pool. Wells to be located in SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of each quarter sec- tion (80 acres) and in SE $\frac{1}{4}$ of each quarter section on 160-acre spacing. (Orders 1-56, 8-56, 15-61, 20-62, 4-63, 7-63.)	

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules		Secondary Recovery or Water Disposal
PINE Siluro-Ordovician	129	Structural	Comb. Depletion and Water Drive	Spacing and General Rules 213, 218 and 219 are waived within the Pine Unit. 80-acre spacing units outside of unit area; well location in NW ¹ / ₄ and SE ¹ / ₄ or quarter section; 150' topographic tolerance. (Order 37-62.)		A pressure maintenance program was started March 10, 1959, by injecting water into producing horizon. (Orders 13-58, 1-60, 8-62A.) Most of produced water is used in pressure maintenance. Some produced water is disposed into Dakota formation. (Order 7-58.)
PLEVNA Judith River, Eagle (Gas) (U. Cret.)	27	Structural	Water Drive	(Judith River, Eagle) Gas: 1200' from legal subdivision line; 2400' from other wells on same lease or unit; 75' topographic tolerance. (Order 3-54, 4-57.)		None
POLE CREEK Amsden (Penn.)	4	Structural	Water Drive	State-wide.		None
PONDERA Madison (Miss.)	314	Structural and Strat.	Comb. Depletion and Water Drive	(Ellis-Madison, Sawtooth) Oil: 220' from legal subdivision, 430' from other wells in same reservoir on same lease; 75' topographic tolerance. Porter Bench Extension: 330' from legal subdivision line; 650' from other wells in same reservoir on same lease or unit; 75' topographic tolerance. (Order 9-54.) Gas: 1320' from legal subdivision line; 3700' from other wells on same lease or unit; 75' topographic tolerance. (Order 9-54.) General Rules 207, 211, 219, 221, 223, and 224 do not apply.		Produced water injected into lower Madison. (Orders 11-56, 15-56, 4-65, 4-66.) A small waterflood project has been in operation since 1959.
PONDERA COULEE Madison (Miss.)	4	Structural	Water Drive	330' from legal subdivision lines or upon a 10-acre spacing pattern; 75' topographic tolerance. (Order 5-62.)		None
POPLAR Madison (Miss.)	70	Structural	Water Drive	State-wide spacing; field delineated by Order 7-55.		Excess produced water has been injected into the Dakota and Judith River formations. (Orders 1-55, 5-57, 7-57, 14-61, 21-61, 34-61, 10-62.)
POPLAR, NORTHWEST Madison (Miss.)	4	Structural	Water Drive	80-acre spacing units consisting of E ¹ / ₂ and W ¹ / ₂ of each quarter section; permitted wells in NW ¹ / ₄ and SE ¹ / ₄ of quarter section. 75' topographic tolerance. (Order 18-55.)		None
PRAIRIE ELK Charles "C" (Miss.)	1	Unknown	Water Drive	State-wide spacing.		None
RAGGED POINT Tyler (Penn.)	13	Strat.	Depletion	Tyler: 40-acre spacing units; 75' topographic tolerance. (Order 8-59.) Spacing waived for Tyler "A" sand reservoir within Tyler "A" Sand Unit except no well can be closer than 660' to Unit boundary. (Order 35-65.) Kibbey: State-wide spacing. (Order 15-54.) Commencing of production from Tyler and Kibbey permitted in one well per Order 11-65.		A waterflood project of the Tyler "A" sand was commenced in February, 1966.
Kibbey (Miss.)	1	Structural	Water Drive			

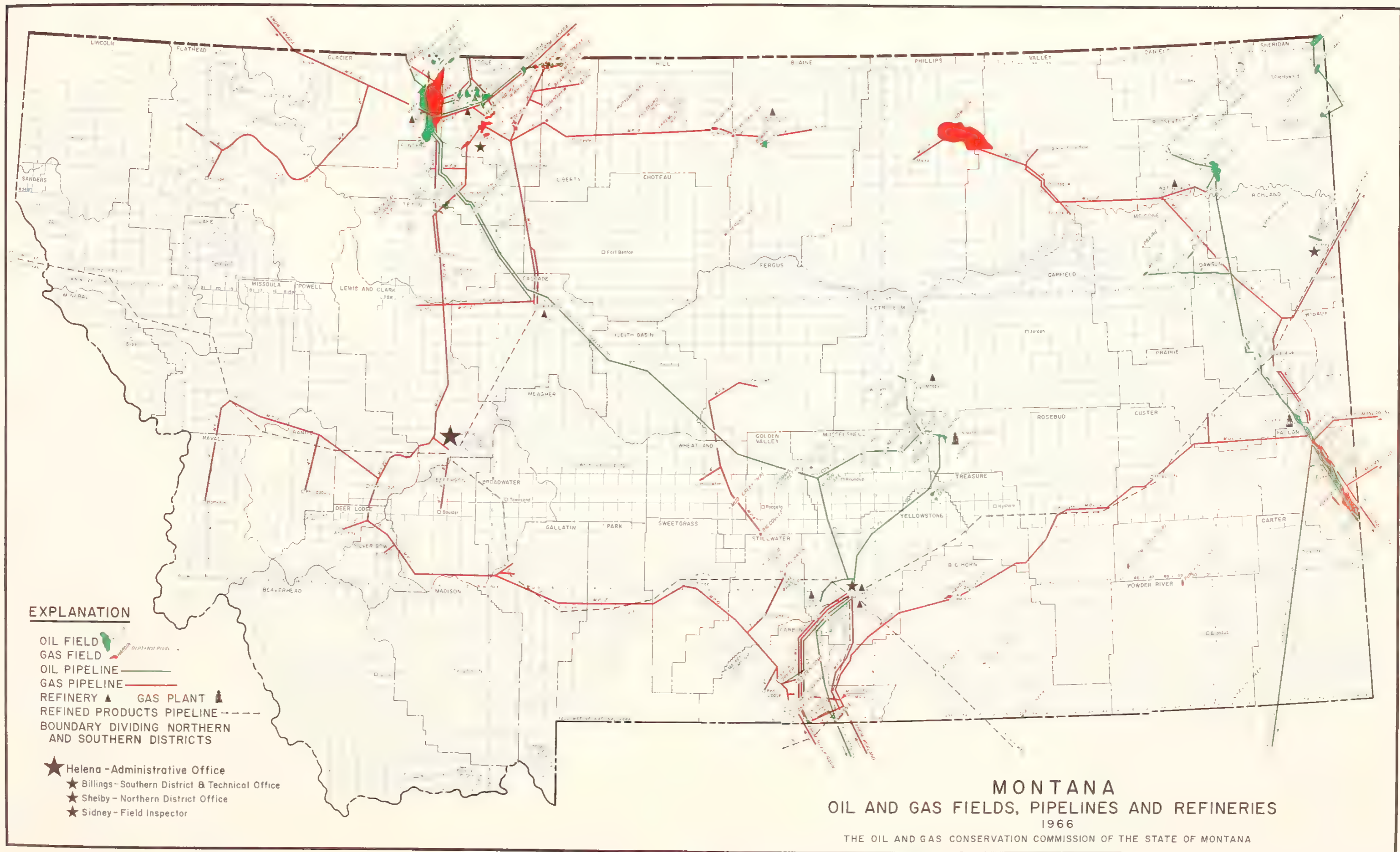
Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
RANCH CREEK Muddy (L. Cret.)	4	Unknown	Depletion	State-wide spacing.	None
RATTLESNAKE COULEE Sunburst (L. Cret.)	1	Strat.	Depletion	State-wide spacing.	None
REAGAN Madison (Miss.)	46	Structural	Comb. Gas Cap and Water Drive	State-wide spacing.	A pressure maintenance project utilizing gas injection was started in 1961. (Order 21-60.)
RED CREEK Cut Bank (L. Cret.)	16	Strat.	Depletion	(Madison, Sunburst, & Cut Bank) 40-acre spacing units; well in center of spacing unit with 75' topographic tolerance; spacing waived for unitized portion. (Orders 16-58, 73-62, 31-64.)	Excess produced water injected into Bow Island and Madison. (Order 22-63, 37-64.) A waterflood project in the Cut Bank sand was initiated in June, 1965.
REDSTONE Winnipegosis (Dev.)	1	Unknown	Water Drive	State-wide spacing.	None
REPEAT Red River (Ordovician)	1	Unknown	Water Drive	State-wide spacing.	None
RESERVE Interlake, Red River (Silurian-Ordovician)	1	Unknown	Unknown	(Interlake, Red River) 160-acre spacing units; permitted well within 1320' square in center of quarter section. Commingling of Red River and Interlake production permitted on individual well basis. (Order 34-66.)	None
RICHEY Charles (Miss.)	3	Structural	Water Drive	(Charles) 80-acre spacing units consisting of any two adjacent quarter-quarter sections; well locations in center of NW 1/4 and SE 1/4 of each quarter section; 75' topographic tolerance. (Order 21-55.)	Part of produced water is being injected into the Dakota formation. (Orders 10-58, 19-61.)
RICHEY, SOUTHWEST Interlake, Dawson Bay	8	Structural	Depletion	(Devonian, Silurian, Ordovician) 160-acre spacing units; wells no closer than 900' from boundary of spacing unit. (Order 25-62.)	A waterflood project in the Interlake and Dawson Bay was started in 1965.
RUDYARD Sawtooth (Jurassic) (Gas)	3 Shut-in	Structural	Volumetric	(Sawtooth) Gas; 640-acre spacing units consisting of one section; well location in center of NW 1/4 of section with 75' topographic tolerance. (Order 2-58.)	None
SAND CREEK Interlake, Red River (Silurian, Ordovician)	8	Structural	Water Drive	(Interlake and Red River) 80-acre spacing units consisting of any two adjacent quarter-quarter sections. Wells located in center of NW 1/4 and SE 1/4 of each quarter section. (Order 16-59.) Commingling of production from Interlake and Red River authorized per Order 49-62.)	Excess produced water is injected into the Swift formation. (Order 9-61.)
SHOTGUN CREEK Madison (Miss.)	1	Structural	Water Drive	State-wide spacing.	None

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
SIDNEY-BRORSON Mission Canyon (Miss.)	2	Structural	Water Drive	(Madison) 320-acre spacing units consisting of one-half section which may be either the east and west or north and south halves. Well location in NW 1/4 and SE 1/4 of each section; tolerance area consists of the center 40 acres in the NW 1/4 or SE 1/4 of each section. (Orders 30-62, 12-63.)	None
SNYDER Tensleep (Penn.)	4	Structural	Water Drive	10-acre spacing units with center 5-spot permitted; 150' topographic tolerance. (Order 45-62.)	None
SOAP CREEK Tensleep, Amsden, Madison (Penn., Miss.)	15	Structural	Water Drive	One well per 10-acre spacing unit per production formation; well location in center of spacing unit with 75' topographic tolerance. (Order 26-60.)	None
SPRING LAKE Nisku (Dev.)	1	Structural	Depletion	(Nisku, Red River) One well per 160-acre spacing unit. Well location anywhere within 840' square in center of spacing unit. (Order 6-63.)	None
STENSVD Tyler (Penn.)	2	Structural	Depletion		
	24	Strat.	Depletion	40-acre spacing units; well location in center of spacing unit with 200' tolerance. (Orders 2-59, 7-60.) Wells may be drilled anywhere within waterflood unit boundary, no closer than 660' from unit boundary. (Order 5-65 Amended.)	A waterflood operation has been in progress since 1963. (Orders 53-62, 9-67.)
SUMATRA Tyler (Penn.) Amsden (Penn.)	78 2	Strat. Strat. and Structural	Depletion Water Drive	40-acre spacing units; well located in center of unit with 75' tolerance. (Order 14-58.)	None
TULE CREEK Nisku (Dev.)	7	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within 1320' square in center of each unit. (Orders 26-62, 6-65.)	Produced water injected into the Dakota formation.
TULE CREEK, EAST Nisku (Dev.)	2	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within 1320' square in center of each unit. (Orders 40-46, 6-65.)	None
TULE CREEK, SOUTH Nisku (Dev.)	2	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within a 1320' square in center of each unit.	Authority given to dispose of produced water into Judith River and Dakota. (Order 44-64.)
UTOPIA Sawtooth, Madison (Gas) (Jurassic, Miss.)	6	Structural	Unknown	State-wide gas spacing.	None
VIDA Interlake (Silurian)	2	Structural	Water Drive	(Interlake) 160-acre spacing units with permitted well anywhere within an 840' square in center of each unit. (Order 39-63.)	None

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
VOLT Nisku (Dev.)	5	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within a 1320' square in center of each unit. (Order 27-64, 6-65.) (Charles) State-wide spacing.	Excess produced water is disposed into Judith River. (Order 3-65.)
Charles (Miss.)	1	Structural	Water Drive		
WELDON Kibbey (Miss.)	18	Structural	Partial Water Drive	(Kibbey) 80-acre spacing unit; each quarter section divided into two separate units running in either a north-south or east-west direction; well location in center of NE $\frac{1}{4}$ and SW $\frac{1}{4}$ of quarter section with 200' topographic tolerance. (Order 9-65.)	Excess produced water is disposed into the Charles and Morrison formations. (Orders 31-65, 47-65, 37-66.)
WHITLASH Blackleaf, Kootenai, Swift (Cretaceous, Jurassic)	44	Comb. Strat. and Struct.	Volumetric	Gas: 330' from legal subdivision line and 2400' between wells; 75' topographic tolerance. Oil: 330' from legal subdivision line and 650' between wells; 5-spot location at center of 40-acre tract permitted; 75' topographic tolerance. General Rules 207, 211, 219, 221, 223, and 224 suspended. (Order 16-54.)	None
WHITLASH, WEST Sunburst, Swift (Cretaceous, Jurassic)	15	Structural and Strat.	Volumetric	Gas: 160-acre spacing units consisting of quarter sections; well location anywhere within a 660' square in center of spacing unit. Oil: 330' from legal subdivision line, 650' between wells in same reservoir on same lease; 5-spot location permitted. (Order 61-62.)	None
WILLS CREEK, SOUTH Siluro-Ordovician	2	Structural	Partial Water Drive	(Siluro-Ordovician) 160-acre spacing units. Well location in center of SE $\frac{1}{4}$ of each unit with 175' topographic tolerance. (Orders 5-64, 30-66.)	None
WOLF SPRINGS Amsden (Penn.)	12	Structural	Water Drive	(Amsden) 80-acre spacing units consisting of N $\frac{1}{2}$ and S $\frac{1}{2}$ of each quarter section. Well location in center of NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of each quarter section with 75' topographic tolerance. (Orders 4-56, 9-59.)	None
WOODROW Charles, Duperow, Interlake, Red River (Miss., Dev., Silurian, Ordovician)	5	Structural	Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections; well locations in center of NE $\frac{1}{4}$ and SW $\frac{1}{4}$ of each quarter section with 200' topographic tolerance. (Order 47-62.)	Produced water injected into Dakota. (Order 48-62.)

STATE OF MONTANA — SUMMARY OF PRODUCING OIL FIELDS

LINE NO.	FIELD (OR POOL)	COUNTY	YEAR DISCOVERED	PRODUCTION FORMATION	APPROX. DEPTH	A.P.I. GRAVITY	VOLUME FACTOR	AVG. NET PAY FT.	AVG. POROSITY %	AVG. CONNATE WATER %	ORIGINAL OIL IN PLACE BBL./ACRE	PRODUCTIVE AREA 1-1-67 ACRES	ORIGINAL OIL IN PLACE 1000 BBL.	ESTIMATED RECOVERY FACTOR %		ORIGINAL RESERVES 1000 BBL.		TOTAL ORIGINAL RESERVES 1000 BBL.	CUMULATIVE PRODUCTION 1-1-67 1000 BBL.	REMAINING RESERVES 1-1-67 1000 BBL.	1966 PRODUCTION		ORIGINAL RECOVERABLE RESERVES		LINE NO.
														PRIMARY	SECONDARY	PRIMARY	SECONDARY				TOTAL BBL.	AVG. DAILY BOPD	BBL./ACRE	BBL./FT.	
1	Ash Creek (Montana)	Big Horn	1952	Shannon (U. Cret.)	4500	34	1.05	14	22	42	13,199	200	2,640	25	31	660	158	818	526	292	72,609	199	4,090	292	1
2	Bannette	Teton	1927	Swift (U. Jur.)	1450	27	1.05	39	15	43	24,635	170	4,188	5	--	209	--	209	186	23	5,074	14	1,229	32	2
3	Bears Den	Liberty	1924	Sunburst (L. Cret.)	2300	39	1.08	20	12	35	11,205	200	2,241	17	--	381	--	381	295	86	20,190	55	1,905	95	3
4	Benrud	Roosevelt	1961	Nisku (Dev.)	7650	43	1.41	22	16	30	13,557	80	1,085	20	--	217	--	217	138	79	29,084	80	2,713	123	4
5	Benrud, East	Roosevelt	1962	Nisku (Dev.)	7500	46	1.37	35	15	30	20,811	160	3,330	33	--	1,099	--	1,099	632	467	111,420	305	6,869	196	5
6	Benrud, Northeast	Roosevelt	1964	Nisku (Dev.)	7620	46	1.4	45	15.5	30	27,054	160	4,329	30	--	1,299	--	1,299	409	890	182,354	500	8,119	180	6
7	Big Wall	Musselshell	1948	Tyler (Penn.)	3000	31	1.02	22	17	40	17,068	1,220	20,821	31	36	6,455	1,041	7,496	4,884	2,612	162,911	446	6,144	279	7
8	Big Wall	Musselshell	1953	Amsden (Penn.)	2500	19	1.61	17	16	35	8,517	280	2,385	23	--	548	--	548	480	68	40,899	112	1,957	115	8
9	Blackfoot	Glacier	1955	Madison (Miss.)	3550	25	1.11	8	14	40	4,533	480	2,176	32	--	696	--	696	32	--	--	--	--	--	9
10	Blackfoot	Glacier	1955	Cut Bank (L. Cret.)	3500	30	1.11	15	15	35	10,221	160	1,635	20	--	327	--	1,023	818	205	50,278	138	1,450	181	9
11	Bowes	Blaine	1949	Sawtooth (M. Jur.)	3250	19	1.02	37	11.7	31	22,718	3,760	85,420	8	10	6,834	1,708	8,542	6,735	1,807	180,941	496	2,272	61	11
12	Brady	Pondera	1942	Sunburst (L. Cret.)	1500	34	1.01	10	12	30	6,452	140	903	7	--	53	--	53	32	28	3,001	8	450	45	12
13	Cabin Creek	Fallon	1953	Siluro-Ordovician	8400	33	1.20	50	13	30	29,415	7,620	224,142	22	30	49,311	17,931	67,242	35,779	31,463	2,373,193	6,502	8,824	176	13
14	Cabin Creek	Fallon	1956	Mission Canyon (Miss.)	7300	33	1.13	25	11	30	13,215	2,259	29,853	35	--	10,449	--	10,449	5,830	4,619	725,438	1,988	4,625	185	14
15	Cat Creek (West Dome)	Petroleum	1920	Kootenai (L. Cret.)	1100	52	1.10	51	21	19	--	975	59,650	25	39	14,913	8,351	23,264	16,526	6,738	110,063	302	23,860	468	15
16	Cat Creek (Antelope-Hosby)	Petroleum, Garfield	1920	Kootenai (L. Cret.)	1225	52	1.10	10	21	19	11,997	200	2,399	22	11	528	264	6,249	4,351	1,898	68,945	189	3,960	396	16
17	Cat Creek	Petroleum, Garfield	1945	Morrison (U. Jur.)	1600	52	1.10	6	22	40	5,586	240	1,340	32	--	428	--	6,249	4,351	1,898	68,945	189	3,960	396	16
18	Cat Creek	Petroleum, Garfield	1945	Ellis (U. Jur.)	1750	52	1.10	25	18	40	19,050	880	16,764	30	--	5,029	--	6,249	4,351	1,898	68,945	189	3,960	396	16
19	Cut Bank	Glacier, Toole	1932	Kootenai (L. Cret.)	2900	38	1.09	18	15	35	12,492	49,000	612,108	20	31	122,422	67,332	189,754	100,513	89,241	3,902,643	10,692	5,715	229	18
20	Cut Bank	Glacier, Toole	1945	Madison (Miss.)	3000	39	1.10	10	14	30	6,911	3,200	2,211	28	--	6,192	--	6,192	5,484	708	135,908	372	1,935	194	19
21	Deer Creek	Dawson	1952	Red River (U. Ord.)	9900	41	1.2	90	7	30	28,530	240	6,847	15	--	1,027	--	1,027	995	32	5,442	15	4,279	48	21
22	Deer Creek	Dawson	1956	Interlake (Sil.)	9400	43	1.2	38	6.7	30	11,514	320	3,684	34	--	1,253	--	1,253	1,058	195	36,142	99	3,916	103	22
23	Dwyer	Sheridan	1960	Mission Canyon (Miss.)	8000	33	1.12	30	11.8	55	11,034	4,800	52,963	9	--	4,767	--	4,767	3,481	1,286	335,024	918	993	33	23
24	Elk Basin (Montana Portion)	Carbon	1915	Frontier (U. Cret.)	1200	45	1.16	30	21	20	33,720	120	4,046	--	33	--	1,335	1,335	1,296	39	11,265	3	1,125	371	24
25	Elk Basin (Montana Portion)	Carbon	1942	Embar-Tensleep (Perm.-Penn.)	5000	29	1.16	124	10.5	10	78,368	1,376	107,834	--	57	--	61,465	61,465	41,814	19,651	2,141,308	5,867	44,660	350	25
26	Elk Basin (Montana Portion)	Carbon	1946	Madison (Miss.)	5300	28	1.12	224	12	9	169,434	920	155,879	24	28	37,411	6,235	43,646	11,248	32,398	806,302	2,209	47,441	212	26
27	Elk Basin (Montana Portion)	Carbon	1963	Jefferson (Dev.)	5400	28	1.18	64	6.5	31	18,867	40	755	4	--	30	--	30	28	2	1,736	5	700	11	27
28	Elk Basin, Northwest	Carbon	1947	Frontier (U. Cret.)	3375	47	1.29	28	19	30	22,394	120	2,687	25	46	672	564	1,236	1,020	216	35,070	96	10,300	368	28
29	Elk Basin, Northwest	Carbon	1947	Madison (Miss.)	6215	35	1.08	124	12	35	69,477	300	20,843	15	--	2,084	--	2,084	836	1,248	13,155	36	10,420	84	29
30	Elk Basin, Northwest	Carbon	1964	Embar-Tensleep (Perm.-Penn.)	6000	27	1.15	27	11.5	22	16,338	580	9,476	15	28	1,421	1,232	2,653	583	2,070	182,194	499	4,524	169	30
31	Fairview	Richland	1965	Red River (U. Ord.)	12650	47	1.70	42	8.9	28	12,281	320	3,930	20	--	786	--	786	265	521	201,965	553	2,456	58	31
32	Fertile Prairie	Fallon	1952	Red River (U. Ord.)	9250	29	1.2	6	14	27	3,964	400	1,586	25	--	397	--	397	250	147	24,750	68	993	166	32
33	Flat Coulee	Liberty	1933	Swift (U. Jur.)	2900	37	1.1	18	21	35	17,329	1,280	22,181	13	24	2,884	2,440								



GENERALIZED STRATIGRAPHIC CORRELATION CHART

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